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that the word "disability" was already to be found in ordinary English dictionaries in the year 1906.) "It was believed," says President Pritchett, "that the number of teachers who would avail themselves of retirement under such conditions would be confined almost exclusively to those who were physically impaired."

In accordance with this retroactive construction of the original rules and announcements—a construction nowhere sanctioned by anything in the language of them—the president of the foundation reflects severely upon the twenty-eight persons who, without disability, accepted service pensions.

The expectation that this rule would be taken advantage of almost wholly on the ground of disabilities has proved to be ill-founded. . . . The correspondence . . . indicates that a number of teachers have persuaded themselves that they are specially intended for research. Some of these have a small income, which, even with the minimum pension, promises a safe, if not ample, support. Others are "tired of teaching." It seems that this rule offers too large a temptation to certain qualities of universal human nature.

From this and other recent statements it appears not only that no one is assured of actually receiving the retiring allowances which the foundation by its rules at any given time announces it will grant, but also that those who are granted pensions upon terms which seem to be clearly understood, and to be sanctioned by the foundation at the time, may thereafter be subject to censure from the president of the foundation for having taken the pensions which were offered them. This is not a situation wholly calculated to increase the attractiveness of the foundation's pension system, or "to dignify and strengthen the calling of the teacher."<sup>3</sup> It certainly affords conclusive evidence, which should be pondered by professors and governing boards in "accepted institutions," that the apparently plain language of the foundation's rules gives no clue whatever as to what the officials of the foundation may subsequently announce that they have previously been anticipating.

<sup>3</sup> First Report, p. 31.

The recent report also mentions, among the chief reasons for the abolition of the service pension, "the tendency of the teacher assured of a retiring allowance to become ultra-critical toward the administration" of his university. This seems to mean, if it means anything, either that an important proportion of the members of the profession are kept in order only through their fear of losing their positions, and that, if assured of an independent competency, they would forthwith behave in an unreasonable manner; or else it means that, whether the criticism that might proceed from professors were reasonable or not, they should, in any case, be kept silent and subservient by a mild form of terrorism. I can not think that the publication, by a person holding the position of the president of the Carnegie Foundation, of such views as this concerning the average character and self-respect and the proper status of the members of our profession, is likely to improve the public standing of that profession. There seems to be grave reason to conclude that it is time for the rank and file of the teaching body to demand that the management of the Carnegie Foundation shall be altered in whatever manner is necessary in order to protect them against the sort of deception and the sort of indignity to which they have been subjected in the recent administration of this potentially beneficent institution.

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THE NORWOOD "METEORITE" A FRAUD.<sup>1</sup> HOW  
METEORITIC EVIDENCE MAY BE  
MANUFACTURED

TO THE EDITOR OF SCIENCE: As a result of continued investigation of the supposed Norwood "meteorite," I am now able to state definitely that the whole thing is a cunningly devised fraud. In order that investigators may be on their guard against similar deceptions, it seems to me desirable to put the facts on record. I will first state the apparent facts.

<sup>1</sup> See SCIENCE, N. S., Vol. XXXI., No. 787, January 28, 1910, pp. 143 and 156.

Mr. Herbert S. Winslow, who is a trained hunter with excellent powers of observation, was standing near Walpole Street, a little beyond Chapel Street, in Norwood, and had an unobstructed view of the western sky in a quiet country neighborhood. He was looking upward and saw a brilliant object appear in the west at an altitude of about  $60^{\circ}$ . It fell slowly at first, then quite rapidly, disappearing behind some distant pine trees in a direction a trifle north of west in about 7 seconds. There was an increase in apparent size in the ratio of not over 3 to 1. The brightness varied in a somewhat larger ratio. The object was pear-shaped, sharply pointed at the advancing (lower) extremity, but rounded above, about twice as long as broad and as large as the moon, brightest at the margins, and of an orange-red color. It moved with a wavy, serpentine motion, and gave off numerous white sparklets on either side, about as bright as Polaris. These sparklets faded out before traversing a distance greater than the length of the main body. The object fell in the direction of the Nickerson farm, distant 0.8 miles, and was different from an ordinary shooting star. Its considerable angular dimensions imply a flaming mantle of incandescent vapor. The time was 6:42 P.M., October 7, 1909. Other observers in Norwood confirmed enough of these statements to make the fact beyond dispute; but, singularly, I could find no witnesses from surrounding towns after assiduous search.

The motion having been very slow at first, but rapid at the end, the appearance was not inconsistent with the supposition that the object might have been advancing at first nearly end-on, and that the path then curved rapidly into a vertical direction—a motion of which there was good evidence in the fall of a 33-pound meteorite at Krähenberg in Bavaria, May 25, 1869, which is said to have “entered the ground to a depth of from three to four feet, making a perfectly vertical hole”; but from observations at neighboring places, “the inclination of the path of the meteor to the horizon is computed to have been  $32^{\circ}$ .”

<sup>2</sup>Dr. Flight, “History of Meteorites,” p. 5.

The serpentine motion is sometimes witnessed in shooting stars. I have never seen *white* sparklets from an *orange*-colored meteor, although I have witnessed the fading of exploded fragments of a brilliant white meteor through yellow and orange to red. The fall of a bolide without noteworthy sound is exceptional, but not unprecedented. Ordinarily, the noises are very loud, often “terrific.”

The following coincidences are to be noted:

1. An object not unlike a fire-ball was seen to fall in a given direction.

2. At a point in this direction, and within a few hours after the occurrence, a farm hand who knew nothing about the fire-ball, found that a set of bars had been unaccountably broken at some time during the previous night.

3. A peculiar, large and heavy stone—an ophitic andesite porphyry, entirely different from the glacial boulders of the vicinity—a stone quite competent to smash the bars if fired through them with the velocity of a cannon shot, but not able to do the damage if it had been merely dropped from a height of a few feet, was found directly under the break, according to the statement of Mr. W. P. Nickerson, the owner of the farm.

4. The stone had apparently penetrated deeply into the soft sand, as if it had dropped with great velocity.

5. On being pried out of the sand, the lower and better protected end of the stone, which would naturally be the advancing end, was found to be still hot (statement of the farmer, confirmed by workmen, and by an unprejudiced neighbor).

6. The sand around the stone was dry, whereas the surrounding earth was moist, on authority of Mr. Nickerson.

The peculiar composition of the stone, while distinguishing it clearly from local boulders, equally differentiated it from all known aerolites, and was a distinct difficulty in the way of accepting the stone as a meteorite. I at first thought that this difficulty might be met, the absence of an external vitrified coat being attributable to a description of the ground-mass of which the sparks might have been an

evidence, and was more impressed by the fact that the disturbance of the ground at the point of impact was not as great as I should have anticipated. So far, the evidence, though puzzling, seemed too strong to be summarily rejected.

A diligent search of the surroundings and an excavation which I made at the supposed point of impact to a depth below all previous disturbance, had failed to reveal any other stone of a meteoritic nature. The composition of the specimen was quite different from that of neighboring dike rocks, and was absolutely unlike the vast majority of granite, diorite, and dark, banded, or concretionary felsitic boulders of the local glacial drift. The surfacing was such as a water-worn boulder of its composition might receive, if it had lain for a long time in a peat bog, where the fine-grained ground-mass could be disintegrated, leaving the phenocrysts protruding. The actual site, however, was not of this description, but was on the sloping border of a dissected sand-plain, some twenty to thirty feet above the neighboring valley.

Now for the real facts: It appears that the proprietor of a cheap vaudeville show in Boston, purchased the "meteorite" from a Vermont man. It was said to have "fallen" in New Hampshire. The new owner seems to have thought it necessary to work the thing up and give it "local color." Accordingly, the stone (previously heated?) was taken to Norwood in an automobile, by night, and deposited on the farm of Mr. Nickerson, who was in the secret. I have talked with one of the employees of the dime-museum, who confessed that he was the man who broke the bars in the night. The next morning, Mr. Nickerson made an errand for one of the farm hands to the pasture (to hunt up a stray cow, or some such thing), the errand being so arranged that the man could not help finding the broken bars. On receiving the report of the occurrence, the farmer was apparently the most surprised man in town. Close questioning could not trip him.

I have been unable to ascertain how or when the stone was heated, nor do I know the secret

of the fire-ball; but I suggest that the luminous appearance may have been produced in the following way: A large inverted rocket of suitable make, suspended from a (captive?) balloon, may have been sent up to a height of something over a mile, being provided with a time-fuse which burst the balloon and started the rocket downward at the same time. The farmer, in giving his version said: "My first idea was that the stone had been dropped from a balloon," showing that his mind was running on balloons. A vague story, insufficiently corroborated, has reached me, which implies that a similar bright object was seen in the same direction about four hours later on the same night, which possibly signifies that the rocket scheme was worked twice in order to make sure that the light should be seen by somebody not in the business, and whose testimony could not be impeached.

A few words in regard to the petrographical examination of the stone may be in order, since they may lead to an identification of the locality of an interesting specimen. It has every appearance of having been originally derived from an ancient terrestrial igneous rock which has been metamorphosed to some extent by hot mineral waters under heavy pressure, but shows little evidence of the action of mountain-building forces. Microscopic examination of a thin section shows that the material consists largely of labradorite feldspar arranged in ophitic structure. The clear greenish-white crystals appear entirely transparent in section, except for some trifling inclusions, namely, a few very minute crystals of yellow muscovite (sericite), and some irregular masses of pale brownish-yellow, lime-alumina garnet (grossularite). The corners of the feldspar crystals are mostly quite sharp, but a few are well rounded, as if they had suffered considerable attrition in the original magmatic flow. There are a few transverse fractures, but hardly any displacement. The edges of several crystals have been metamorphosed to albite. A measurement of the extinction angle on center and margin gives me: Lab.-Alb. =  $-47^{\circ} 55'$ , in which, assuming an uncorrected albite angle of  $+18^{\circ}$ , there

remains an uncorrected labradorite angle of  $-29^{\circ} 55'$ . I apply to these proportional corrections, namely, for albite  $+1^{\circ}$ , giving the true albite angle  $= +19^{\circ}$ ; and for labradorite a correction of  $-1^{\circ} 30'$ , giving true angle  $= -31^{\circ} 25'$ ; which corresponds to a labradorite formula of albite 1, anorthite 4. A mean of the extinctions on opposite sides of a twinning plane in a typical labradorite crystal gave  $-31^{\circ} 18'$ , which agrees with the previous determination of  $\text{Ab}_1\text{An}_4$ . The crystals, 1 or 2 mm. wide, and 5 to 10 mm. long, form a pretty closely parallel ophitic structure. A few crystals show Carlsbad twinning.

The ground-mass between the parallel feldspars is made up of a micro-crystalline mesh of the same material with very fine crystals (0.01 mm.) of a dark green pleochroic mineral, which appears to be biotite, and with equally minute crystals of magnetite, together with some titanite. The crushed mineral is almost entirely decolorized by boiling hydrochloric acid. Irregular larger masses of ilmenite with titanite borders, and masses of green biotite (1 to 2 mm. in diameter) in fine crystals, pleochroic with green and brown colors, complete the inclusions within the ground-mass. Dr. G. F. Loughlin, who helped me identify some of the minerals, is of the opinion that the rock has been "contact-metamorphosed, presumably by granitic intrusion, which set free heated water with potash and fluorine. These changed the original ferromagnesian minerals into biotite, and a little of the ilmenite and feldspar into titanite, garnet, sericite and secondary albite." The material is completely crystalline and has a decidedly fresh look, the fracture sparkling with minute crystalline facets.

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#### THE NORWOOD METEORITE (?)

As Professor Very, in *SCIENCE* of January 28, 1910, has seen fit to place on record the discovery of a stone claimed to be a meteorite, but unlike any meteorite hitherto known, a petrographic description of the stone may be of interest. The writer has discussed the

matter with Professor Very, and at his suggestion, viewed the stone (on exhibition in Austin & Stone's Dime Museum), visited the spot where it was discovered and examined a thin-section which Professor Very furnished.

The stone may be called, megascopically, a basalt-porphry. Its color on fresh fracture is nearly black, its luster rather dull. The ground mass is extremely fine-grained to felsitic. It is sprinkled with tabular phenocrysts of labradorite (about 30 per cent. of the rock) and with a few small grains of ilmenite. The natural surface is gray. There are no noticeable oxidation effects, but the ground mass has suffered marked corrosion, such as is produced by swamp waters, leaving the plagioclase phenocrysts in pronounced relief. The latter are greenish-gray, tabular with rounded corners and measure up to 12 or 15 mm. in length. They show in general a parallel arrangement, or flow structure.

The slight salty odor of the stone mentioned by Professor Very was not noted, but may well have been lost in the characteristic atmosphere of the dime museum.

The minerals noted in thin section are labradorite and ilmenite, both as phenocrysts and in the ground mass, biotite, titanite, garnet and sericite, with a little albite (?), epidote and kaolin. The ground mass consists chiefly of plagioclase and biotite. The labradorite phenocrysts show excellent Carlsbad and albite twinning. Both the phenocrysts and the feldspars of the ground mass are but slightly kaolinized, but are partially replaced by garnet, titanite and sericite. The garnet forms irregular grains fingering into the feldspar or the ground mass. The titanite forms rings around ilmenite grains, in some instances fingering into feldspar crystals. The sericite is sprinkled through the feldspar phenocrysts and the ground mass in typical minute flakes, single or in aggregates. The biotite is finely disseminated throughout the ground mass and in a few places is bunched into fine-grained aggregates, strongly suggesting replacement of some femic phenocryst. No trace, however, of any other femic mineral was noted. Only two small grains of